What we claim is:

1. A traffic control apparatus comprising:

a transmission demand generator for generating a transmission demand signal at predetermined intervals set for each channel,

5 a transmission demand counter for counting a generation number of the transmission demand signal for each channel, and

a priority ranking determination portion for determining a transmission priority ranking of each channel based on a value of the transmission demand counter, and for transmitting a highest priority

10 channel designation signal which designates a transmission of a predetermined unit data length of a highest priority channel and a signal which decrements the transmission demand counter corresponding to the highest priority channel.

2. The traffic control apparatus as claimed in claim 1 wherein the

15 transmission demand generator generates the transmission demand signal as a transmission demand signal of fixed length data at intervals corresponding to a transmission rate of each channel, and the priority ranking determination portion transmits the highest priority channel designation signal as a signal for designating a fixed length

20 data transmission of the highest priority channel.

3. The traffic control apparatus as claimed in claim 2 wherein the priority ranking determination portion makes a last highest priority channel a lowest priority from among channels whose transmission demand counter values are not "0", and determines the highest priority

25 channel by a round-robin method in which the highest priority channel is sequentially and recursively selected.

4. The traffic control apparatus as claimed in claim 3 wherein when channel numbers are 1-N and a present highest priority channel number is M ($1 \leq M \leq N$), the priority ranking determination portion is

30 composed of a first priority encoder which makes channels whose transmission demand counter values are not "0" valid channels,

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outputs a minimum channel number selected from the valid channels, or outputs an invalid signal in absence of the valid channels, a second priority encoder which masks channels whose numbers are under M, outputs a minimum channel number selected from the valid channels, and outputs an invalid signal in absence of the valid channels, a determination portion which outputs the minimum channel number outputted by the second priority encoder as a highest priority channel designation signal regardless of an output of the first priority encoder, outputs the minimum channel number outputted by the first priority encoder as a highest priority channel designation signal when the second priority encoder outputs the invalid signal, or outputs an invalid signal when both of the first and the second priority encoders output the invalid signals, and an adder which makes the highest priority channel number + 1 a next highest priority channel number M.

5.   The traffic control apparatus as claimed in claim 4 wherein the priority ranking determination portion further includes a single priority encoder composed of the first and the second priority encoders, a timing generator which controls the priority encoder to perform operations of the first and the second priority encoders by time sharing, and a storage portion which stores an output result of the priority encoder to be provided to the determination portion by a timing designated by the timing generator.

6.   The traffic control apparatus as claimed in claim 1 wherein data of each channel comprise variable length data, the transmission demand generator generates the transmission demand signal as a transmission demand signal of a unit data length at the predetermined intervals corresponding to a transmission rate of each channel, and the priority ranking determination portion transmits, based on a data length of each channel and the value of the transmission demand counter, the highest priority channel designation signal which designates a variable length data transmission of a highest priority

channel, and a signal which designates a subtraction of only a numerical value corresponding to a length of transmitted variable length data from the transmission demand counter corresponding to the highest priority channel.

5   7.   The traffic control apparatus as claimed in claim 1 wherein the priority ranking determination portion performs weighting to the value of the transmission demand counter to determine the transmission priority ranking of each channel.

       8.   The traffic control apparatus as claimed in claim 1 wherein
10   intervals of the transmission demand signals for each channel are set so that a total of transmission rates corresponding to the predetermined intervals set for each channel does not exceed a maximum transmission rate which can be transmitted by at least one of a transmission line and a virtual path including the channel.

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